REMARKS

Claims 1-10 are now pending in the current application. In the Office Action dated April 24, 2002, the Examiner objected to Figures 6 and 7 for failing to comply with 37 CFR § 1.84 (p)(4) due to a lack of consistent use and lack of correspondence between numerical labels in the specification and in Figures 6 and 7, objected to the use of an incorrect label in the specification, rejected claims 1-5 under 35 USC § 112, rejected claims 6 and 8 under 35 USC §102(b) as being anticipated by "The Harp Reconfigurable Computing System," Page, Ian, Oxford University Hardware Compilation Group, October 1994 ("Page"), rejected claims 1, 2, 4, 5, 9, and 10 under 35 USC § 103(a) as being unpatentable over Page in view of Que's Computer Users Dictionary, Fifth Edition., Pfaffenberger, Brian, 1994 ("Que"), rejected claim 3 under 35 USC § 103(a) as being unpatentable over Page in view of Que and further in view of Sudo, U.S. Patent No. 6,047,198 ("Sudo"), and rejected claim 7 under 35 USC § 103(a) as being unpatentable over Page in view of Sudo.

In response to the Examiner's objections to the figures, and to the incorrect use of a numerical label in the specification, Applicants' representative has included the above corrections to the drawings and amendments to the specification, as proposed by the Examiner. In response to the Examiner's 35 USC § 112 rejection, Applicants' representative has accordingly amended claim 1. Applicants' representative respectfully traverses the Examiner's 35 USC § 102(b) and 35 USC § 103 (a) rejections of Claims 1-10.

What Applicants Have Claimed in the Current Application

It has long been recognized by the Federal Courts that if the preamble of a claim is "necessary to give life, meaning, and a vitality" to the claim, then it should be construed as a claim limitation. See, e.g., *Kropa v. Robie*, 187 F. 2d 150, 152 (CCPA 1951). If, on the other hand, the preamble merely states the purpose or the intended use of the invention, then the preamble cannot be said to constitute or explain a claim limitation and is of no significance to claim construction. See, e.g., *Pitney Bowes Inc. v. Hewlett-Packard Co.*, 182 F. 3d 1298, 1305 (Fed. Cir. 1999). Indeed, in section 2111.02 of the MPEP, the MPEP states that:

> [a]ny terminology in the preamble that limits the structure of the claimed invention must be treated as a claim invention. See e.g., *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F. 2d 1251, 1257, 9 USPQ 2d 1962, 1966 (Fed. Cir. 1989) (The determination of whether preamble recitations are structural limitations can be resolved only on review of the entirety of the application "to gain an understanding of what the inventors actually invented and intended to encompass by the claim.")

In independent claim 1 of the current application, Applicants claim a "subsystem controller implemented as a single integrated circuit for control of a device or subsystem within an electronic system ..." In independent claim 6 of the current application, Applicants claim a method for controlling a subsystem that includes the steps of "providing a single-IC subsystem controller," "programming control functionality into the single-IC subsystem controller," and three additional elements that all specifically, distinctly, and clearly recite the term "single-IC subsystem controller."

In independent claim 1, both the phrases "subsystem controller" and the term "single integrated circuit" clearly represent limitations. In independent claim 6, the phrase "single-IC subsystem controller" occurs repeatedly within the elements of the claim. ***In short, Applicants intended to claim in claims 1-10, and did, in fact, clearly claim, a subsystem controller implemented as a single integrated circuit.*** This is clear not only from the claim language, but from the specification. In the Background of the Invention section of the application, Applicants acknowledge that subsystem controllers that include programmable logic arrays or programmable logic devices and a micro-controller are well-known in the art (current application, page 1, lines 24-27). Applicants clearly did not file the current application with an intent to claim well-known subsystem controllers implemented using discrete components, including programmable logic arrays and micro-controllers. Instead, as clearly stated in the Background of the Invention section of the current application, Applicants and others recognized "a need for a versatile, low-cost, easy programmable, and energy-efficient subsystem controller device that can be programmed for a variety of different applications" (current application, page 4, lines 14-17). Applicants realized, during the inventive process, that, in attempting to meet the above goals of energy efficiency and low costs, a versatile, low-cost, easily programmable, and energy efficient subsystem controller might be obtained by devising a single integrated circuit including the various components listed as elements in claim 1, and then proceeded to design a single-integrated-circuit

subsystem controller. In other words, the claimed invention, as is abundantly clear from the contents of the Background of the Invention section of the current application, relates to a single-integrated-circuit, or single-IC, subsystem controller.

In The Electrical Engineering Handbook, Dorf, Richard, CRC Press, 1993, page 614, an integrated circuit or IC is defined as: "an assembly of miniature electronic components simultaneously produced in batch processing, on or within a single substrate, which performs an electronic circuit function." In other words, an integrated circuit is what is commonly referred to a chip. A collection of discrete components soldered to, and electronically interconnected by, signal lines on a printed circuit board is not an integrated circuit.

The term "subsystem controller" is well-known in the art. As stated in the Background of the Invention section of the current application, a subsystem controller "is generally dedicated to one or a small number of specific control tasks." (Page 1, lines 16-17). The current application provides several examples, including control of LED and LCD display devices incorporated in a front panel display of the computer system. As is well-known in the art, a controller controls another device through a set of commands that alter the state of the device and direct the device to carry out tasks corresponding to the commands. Additional examples of subsystem controllers include I/O device controllers. In addition to the term "subsystem controller," claim 1 includes an electronic interface element for interfacing the claimed subsystem controller "to a device or subsystem controlled by the subsystem controller." Thus, Applicants' claimed subsystem controller controls a different device or subsystem within an electronic system containing the subsystem controller.

Prior to Applicants' claimed invention, Applicants' representative can think of no example of a subsystem controller implemented as a single integrated circuit. In fact, there are many reasons why electronics manufacturers neither contemplated nor produced single-integrated-circuit subsystem controllers. First, the discrete components listed in claim 1, including micro-controllers, read-only memories, random-access memories, and complex programmable logic devices, have long been available as discrete, extremely low-cost components. It would have been difficult, prior to Applicants' claimed invention, for an electronics manufacturer to imagine or justify the large design, development, and tooling costs associated with developing and manufacturing a new integrated circuit when these

discrete components were already widely and cheaply available. In fact, as far as Applicants' representative knows, no single-integrated-circuit subsystem controllers were manufactured prior to Applicants' claimed invention. Had it been obvious to do so, then one would well expect that even a single of the countless subsystem controller designs and commercially available subsystem-controller products that existed prior to Applicants' invention would have been implemented as a single integrated circuit. There were no such implementations because a single-integrated-circuit implementation of a subsystem controller was not obvious, and may well have not have represented an economical or practical solution to the problems which Applicants' claimed invention subsequently addressed during much of the period prior to Applicants' invention.

35 USC § 102(b) Rejections

The Examiner rejected Claims 6 and 7 under 35 USC § 102(b) as being anticipated by Page. Page neither teaches nor discloses a single integrated-circuit subsystem controller. In fact, Page does not teach a single-integrated-circuit implementation of any device, and Page does not teach implementation of any subsystem controllers. Instead, Page discloses "a board-level system" with a number of discrete components, including a T805 transputer, a Xilinx 3915 field-programmable gate array, an industry-standard TRAM board, and other components (Page, page 1, third paragraph). Page's device is not a subsystem controller, as the well-known term is employed in the electronics arts, but is instead a platform for compiler research, used to execute various high-level tasks, including a spell-checker. The term "controller" does not stand for any type of software-implemented task, but instead refers to the control of one device by another, as discussed above. As also discussed above, Applicants have clearly and distinctly claimed a single-integrated-circuit subsystem controller. Page cannot possible anticipate Applicants' claimed invention. The Examiner indicates, in section 10 of the Office Action, that Page discloses "providing a single-IC subsystem controller" on page 1, section 1.0, paragraph 3. As discussed above, Page does not disclose providing a single-IC controller, but instead discloses providing a board-level system with a number of discrete components used for research on combined software and hardware compilers. Page cannot possibly anticipate Applicants' claimed invention.

35 USC § 103(a) Rejections

The Examiner rejects claims 1, 2, 4, 5, 9, and 10 under 35 USC § 103(a) as being unpatentable over Page in view of Que. However, as discussed above, Page does not disclose a single integrated-circuit implementation of any kind of device, nor does Page disclose or teach implementation of a subsystem controller, as defined in the current application, and as well-known in the electronics arts. Page's disclosed board-level system is intended as a tool for compiler research and, as discussed in Page, was used to implement such things as spell checkers and other high-level software routines and modules. These applications of Page's board-level system are not related to subsystem controllers. A board-level system, such as that disclosed by Page, cannot be either economically or practically used as a subsystem controller within a modern electronic device, such as computer system. First, it is not economical to produce, in small numbers or in volume. Second, it is far too bulky and energy-inefficient.

In section 15 of the Office Action, the Examiner annotates the elements of claim 1 with references to what the Examiner considers to be equivalent components within the device disclosed in Page, but neglects to annotate certain language in the preamble of claim 1, namely "subsystem controller" and "implemented as a single integrated circuit." In Applicants' representative's view, because neither Page nor Que include any teaching, suggestion, or mention of subsystem controllers or single-integrated-circuit implementations of any kind of electronic device, Applicants' claimed invention cannot possibly be obvious in view of Page and Que.

The Examiner further rejects claims 3 and 7 over Page in view of Sudo. However, again, Sudo does not disclose a single-integrated-circuit implementation of a subsystem controller. Instead, in the figures referred to, and cited by, the Examiner, Sudo shows a standard collection of discrete components included within a computer system. As one example, the Examiner asserts that element 5A of the Figure 4 in Sudo teaches a controller programmed to display information. In fact, as noted in Sudo on lines 13-15, the box labeled 5A in Figure 4 is a liquid crystal display driver, or, in other words, a set of software routines that are run on the CPU to control the LCD 5. Element 5A of Figure 4 is not a controller programmed to display anything. Instead, it is a program. Sudo does not disclose a subsystem controller, because, as pointed out in the Background of the Invention

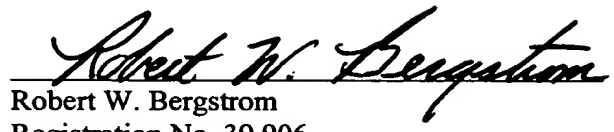
section of the current application, a subsystem controller is a processing component independent of the CPU of the system, that, in part, functions to offload computing tasks from the central processing unit of the system (current application, page 1, lines 19-23). Sudo, by contrast, discloses a software control program that runs on the central processing unit of the system.

Subsequently, the Examiner asserts that "[f]urthermore, using the complex programmable logic device/micro-controller IC system would have allowed for less glue logic such that LCD control would have been part of the overall system control. . . Therefore, it would have been obvious to a person of ordinary skill in the art at the time that the invention was made to employ the IC system controller of Page within the system of Sudo. . ." As discussed above, Page discloses neither a subsystem controller nor a single, integrated-circuit implementation of any kind of device. An integrated circuit corresponds to what is normally referred to as a chip. Page's device is a collection of discrete components soldered to a printed circuit board. Because neither Page, Que, nor Sudo, alone or in combination, teach, mention, or suggest a single-integrated-circuit implementation of a subsystem controller, neither Page, Que, nor Sudo, alone or in combination, can possible serve as an adequate basis for an obvious-type rejection of Applicants' claimed single-IC subsystem controller.

Based on the above remarks, Applicants' representative respectfully requests reconsideration of the application in its early allowance.

Respectfully submitted,

Hendricks & Lewis



Robert W. Bergstrom
Registration No. 39,906

Enclosures:
Postcard
Form PTO-1083 (+ copy)

Hendricks & Lewis
999 Third Avenue, Suite 2675
Seattle, Washington 98104
Phone: (206) 624-1933
Fax: (206) 583-2716

Version With Markings to Show Changes Made

In the Specification

Page 8, paragraph 1, line 5:

The operator may move the highlighting, or mark, up and down through the list of information items by using the up-arrow pushbutton 322 and the down-arrow pushbutton 323[4]. Figure 5 shows the contents of the LCD display window following depression of the down-arrow pushbutton 323[4] twice by an operator. Note that, in Figure 5, the selection mark 502 has moved downwards by 2 entries to mark the information item error log 504.

Page 8, paragraph 2, line 11:

Once the operator has positioned the highlighting, or selection mark, on the information item that the operator desires to display, the operator pushes the pushbutton 321 labeled "Select" to display the selected information. Figure 6 shows the contents of the LCD display window following operator selection of the information item error log. In Figure 6, a number of error log entries are listed in rows 602-607. For example, the first error log entry 602 indicates that drive A failed to write block 776312 at 3:31 p.m. The list of error log entries may be quite lengthy, and may therefore not fit within the LCD display window 318. The operator may scroll through all the entries in the error log using the up-arrow pushbutton 322 and the down-arrow pushbutton 323[4].

In the Claims

1. (Amended) A subsystem controller implemented as a single integrated circuit for control of a device or subsystem within an electronic system having system processing components [implemented as a single integrated circuit], the subsystem controller comprising:

a complex programmable logic device that can be programmed to provide logic circuits that implement control functionality;

a micro-controller that can execute software routines that implement control functionality;

read-only memory that stores executable code for execution by the micro-controller;

random-access memory that can store data and executable code for execution by the micro-controller;

a bus interface for exchanging data and control signals between the subsystem controller and system processing components; and

an additional electronic interface to a device or subsystem controlled by the subsystem controller.